

I	0.10 M	0	0
C	-x	+x	+x
E	0.10-x	x	x

$$\text{pH} = 8.82 \therefore \text{pOH} = 14 - 8.82 = 5.18$$

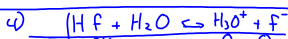
$$\therefore [\text{OH}^-] = 10^{-5.18} = 6.61 \times 10^{-6} \text{ M}$$

$$K_b = \frac{[\text{OH}^-][\text{C}_6\text{H}_5\text{NH}_3^+]}{[\text{C}_6\text{H}_5\text{NH}_2]}$$

$$= \frac{(6.61 \times 10^{-6})^2}{(0.10 - 6.61 \times 10^{-6})}$$

$$= 4.4 \times 10^{-10}$$

8.3



I	0.94	0	0
C	-x	+x	+x
E	(0.94-x)	x	x

Check: $\frac{0.94}{7.2 \times 10^{-4}} > 1000$ use approximation method.

$$\therefore 0.94 - x \approx 0.94$$

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{F}^-]}{[\text{HF}]} \therefore 7.2 \times 10^{-4} = \frac{x^2}{0.94}$$

to find pH, we need $[\text{H}_3\text{O}^+]$ $x = 2.60 \times 10^{-2} \text{ M}$

$$[\text{H}_3\text{O}^+] = x \text{ (check ICE chart)}$$

$$\text{pH} = -\log(2.60 \times 10^{-2}) = 1.58$$



I			
C		+x	+2x
E		x	2x

$$K_{sp} = [\text{Mg}^{2+}][\text{OH}^-]^2$$

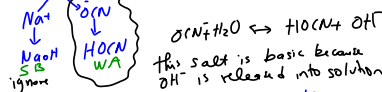
$$= (x)(2x)^2$$

$$= 4x^3$$

Solubility
 $x = \text{mol/L}$

$$\frac{7.6 \text{ mg}}{\text{L}} \times \frac{10^{-3} \text{ g}}{1 \text{ mg}} \times \frac{1 \text{ mol}}{58.3 \text{ g}} = 1.30 \times 10^{-4} \text{ mol/L}$$

$$K_{sp} = 4(1.30 \times 10^{-4})^3 = 8.9 \times 10^{-12}$$



C	0.010 M	0.030 M	7.50 x 10 ⁻⁴ M
V	0.0500 L	0.0167 L	0.0667 L
n	5.0 x 10 ⁻⁴ mol	5.0 x 10 ⁻⁴ mol	5.0 x 10 ⁻⁴ mol

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$$K_b = \frac{K_w}{K_a} = \frac{10^{-14}}{3.5 \times 10^{-4}} = 2.857 \times 10^{-11}$$

Can we approximate? yes $\frac{7.5 \times 10^{-4}}{K_b} > 1000$

$$2.857 \times 10^{-11} = \frac{x^2}{7.5 \times 10^{-4}}$$

$$x = 4.63 \times 10^{-7} \text{ M}$$

$$\text{pH} \rightarrow \text{need } [\text{H}_3\text{O}^+] \quad x = [\text{OH}^-]$$

$$\text{pOH} = -\log 4.63 \times 10^{-7} = 6.33$$

$$\text{pH} = 7.67 \text{ at equivalence}$$

